

Jan. 25, 1927.

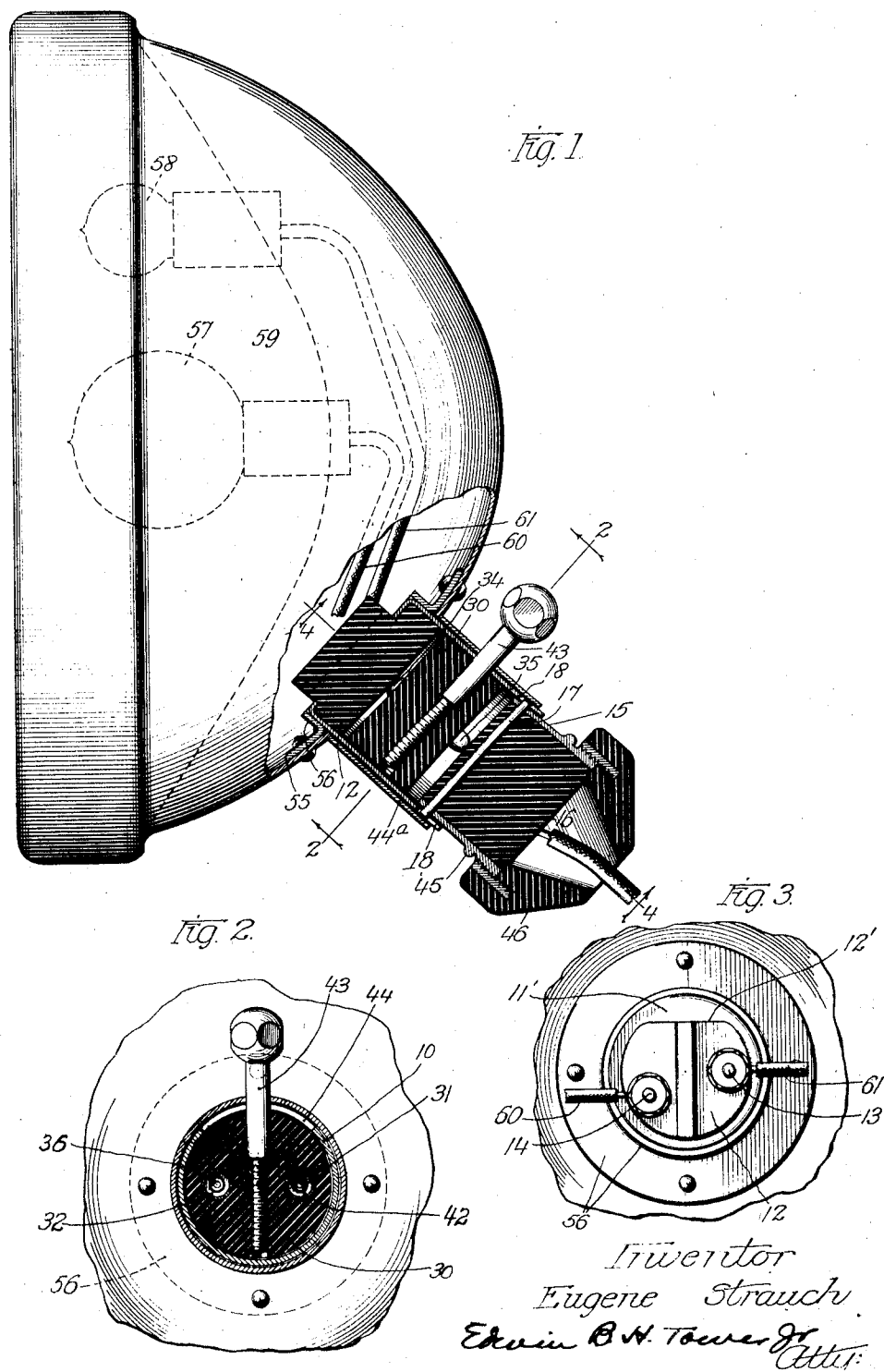
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E. STRAUCH

ELECTRIC SWITCH

Filed Dec. 1, 1919

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Fig. 4.

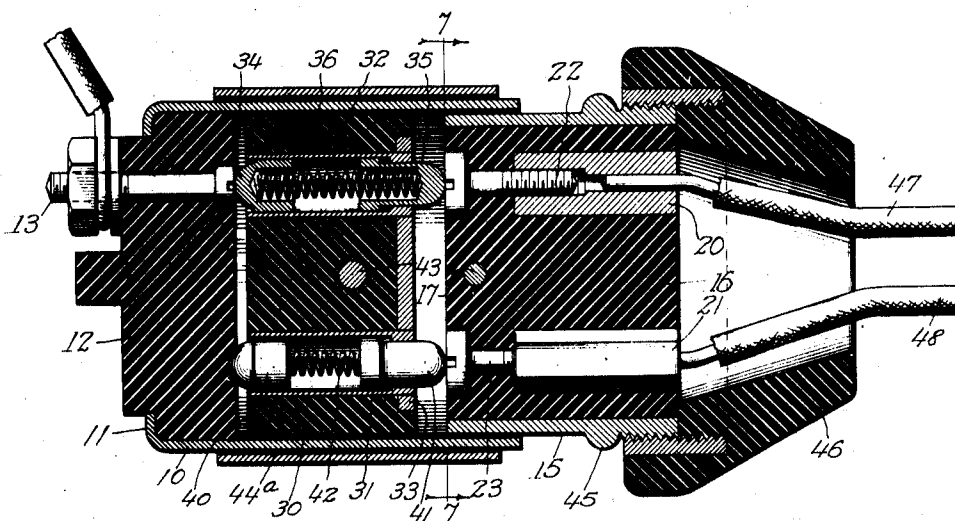


Fig. 5.

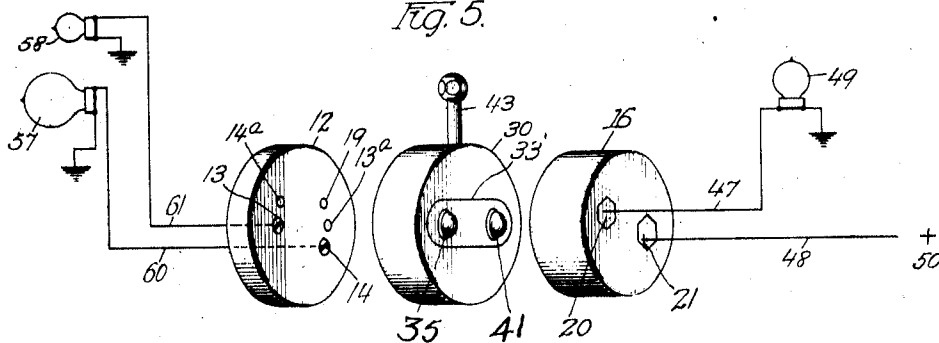


Fig. 6.

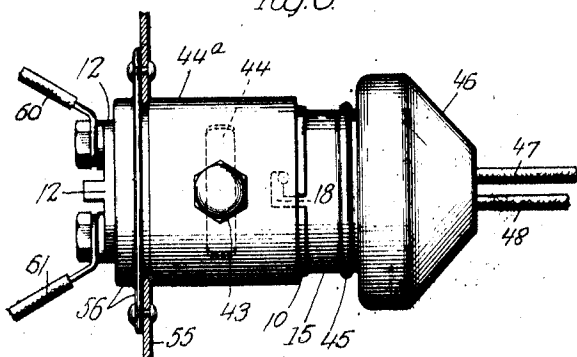
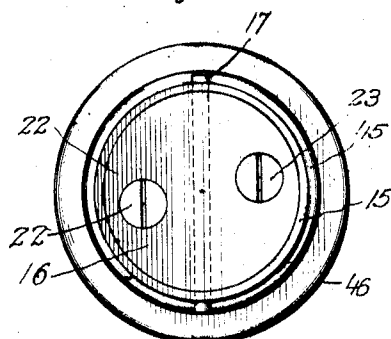


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

Application filed December 1, 1919. Serial No. 341,574.

This invention relates to electric switches.

An object of the invention is to provide an improved electric switch for controlling a plurality of circuits.

Another object is to provide an improved electric switch which may be mounted directly upon the outer casing of a motorcycle head light.

Another object is to provide an improved electric switch which will be small and compact.

Another object is to provide an improved electric switch which will be weatherproof.

Another object is to provide an improved electric switch which may be made of few and simple parts.

Another object is to provide an electric switch which may be readily and quickly assembled.

Another object is to provide an improved electric switch by which several separate electric circuits may be selectively connected to the source of power.

The invention contemplates a switch member which may be rotated into several different positions.

Stationary insulated contacts are supported adjacent both sides of the switch member, one of these contacts being connected to a source of electrical energy and the others to circuits which it is desired to control.

Contacts are carried by the switch member and may be brought into engagement with the contacts connected to the source of electrical energy and with other of the stationary contacts.

For different settings of the switch member, different stationary contacts are engaged by the movable contacts and hence different circuits are connected to the source of power.

The circuits can thus be selectively controlled by the rotation of the switch member.

An embodiment of the invention is illustrated in the accompanying drawings, wherein—

Fig. 1 is a side elevation of a motorcycle head light, to the outer casing of which is attached the electric switch.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is an end view of the electric switch.

Fig. 4 is a longitudinal sectional view on line 4—4 of Fig. 1.

Fig. 5 shows diagrammatically the contact carrying elements of the electric switch connected in circuit with the bright and dim head lamps and the tail lamp of a motorcycle.

Fig. 6 is a top plan of the switch.

Fig. 7 is a sectional view on line 7—7 of Fig. 4.

The electric switch as shown in the drawings comprises in general a tubular casing forming a socket in the bottom of which are carried insulated terminals connected with the bright and dim head lamps and a plug for insertion in the socket, the plug carrying terminals connected with the source of current and the tail lamp. The socket also contains a rotatable block mounted intermediate the terminals and carrying contacting members which cooperate with the terminals to complete in one position, a lighting circuit through the tail and bright head lamps, and in another position, a lighting circuit through the tail and dim head lamps. In the third position of the switch no circuit is completed to the lamps.

The switch has a tubular casing 10 forming a socket and having at one end an inwardly extending flange 11, against which rests the annular shoulder of a disc or block 12 of insulating material. The flange 11 is enlarged at 11' to register with the flat surface 12' of the disk, whereby the disk 12 is properly positioned in the inner end thereof. This block 12 carries two contact screws or conductors 13 and 14 extending through openings therein. The heads of these screws are substantially flush with the face of the insulating block. Depressions 13^a, 14^a, and 19 are provided in the face of the insulating block 12. These depressions and the heads of the screws 13 and 14 are on the circumference of a circle whose center is the center of the cylindrical block 12. The purpose of these depressions and the arrangement thereof in the manner stated will more fully hereinafter appear.

A tubular sleeve 15 within which is positioned a block 16 of insulating material carrying contact terminals, constitutes a plug which is adapted to be inserted in the open end of the socket or casing 10. The block 16 is positioned in the sleeve 15 by means of a pin 17 extending through aligned

openings of the block and sleeve. The ends of the pin 17 extend beyond the outer periphery of the sleeve and cooperate with L-shaped slots 18 in the casing or socket 10 to form a bayonet locking connection between the plug and socket. The insulating block 16 is provided with openings within which fit plug terminals 20 and 21 which are hexagonal in cross section to prevent rotation thereof. The opposite face of the insulating disc 16 is provided with openings for the reception of contact screws 22 and 23 which extend therethrough and respectively engage the plug terminals 20 and 21. These screws serve to maintain the plug terminals securely in position in the insulating block. The heads of the screws are on the circumference of a circle whose center is the center of the cylindrical insulating block 16. The purpose of this arrangement will more fully hereinafter appear. The plug is provided with a cap 46 of insulating material which has screw threaded engagement with the outer end of the sleeve 15 of the plug. A peripheral bead 45 provided on the sleeve 15 may serve as a stop for the cap 46.

A third cylindrical disc or block 30 of insulating material is positioned within the casing 10 intermediate the insulating blocks 12 and 16. This block 30 is provided with longitudinal openings within which are fitted metallic sleeves or guides 31 and 32. Each of these guides is provided at one end with an inwardly extending flange. One end of each of the sleeves or guides 31 and 32 registers with an opening in a metallic plate 33 set in the face of the insulating block 30. This metallic plate serves to maintain electrical contact between the sleeves or guides 31 and 32.

Two contact plungers 34 and 35 spaced apart by a coil spring 36 are slidably mounted within the sleeve 32. The plunger 35 has a flange which abuts the flange of the sleeve 32 to prevent the plunger from falling out of the sleeve or guide when the plug is removed from the socket. Similar contact plungers 40 and 41 spaced apart by a coil spring 42 are slidably mounted within the sleeve 31. The contact plungers extend beyond the faces of the rotatable insulating block 30. The coil springs interconnecting the respective contact plungers maintain the plungers in contact with the respective faces of the contact carrying blocks 12 and 16 or the contacts positioned therein.

The intermediate contact plunger carrying block 30 may be rotated into any one of three different positions by means of a pin 43 registering with a radial opening in the block 30 and having screw threaded engagement therewith. A slot 44 in the sleeve or socket 10 and through which the actuating lever 43 passes limits the rotary movement

of the block 30. A sleeve 44^a which surrounds the casing or socket 10 is provided with a circular opening through which the actuating lever 43 extends. As this actuating lever or rod 43 is oscillated to and fro in the slot 44 the sleeve 44^a moves with the rod and serves as a cover for the slot 44 to prevent the entrance of water into the socket which houses the switch mechanism.

An electric switch constructed as described may be mounted directly on the head light reflector of a motorcycle as shown in Figure 1. The tubular casing or socket 10 containing the switch mechanism extends through an opening in the outer casing 55 of the reflector with the forward end of the sleeve 44^a abutting this outer casing 55. A flange 56 on the inside of the outer casing 55 and riveted or otherwise fastened thereto surrounds the socket 10. The socket may be suitably fastened or secured to the flange 56, as by soldering or welding.

Bright and dim lamps 57 and 58 may be mounted in the head light reflector to project beyond the reflector bowl 59. The bright lamp 57 is connected with the terminal screw 14 of the switch by conductor 60 while the dim lamp 58 is connected with the terminal screw 13 by means of the conductor 61.

Conductors 47 and 48 extending through a central opening in the insulating cap 46 connect the tail lamp 49 and a source of current indicated at 50 with the respective plug terminals 20 and 21. One pole of this source of current is grounded to the frame of the motorcycle. One terminal of each lamp is likewise grounded to the frame of the motorcycle.

When it is desired to light the dim and tail lamps 58 and 49 the insulating block 30 is positioned as indicated in Figure 5. The contact plunger 34, 35 then electrically connects the terminal screw 13 and the contact screw 22 through to 20, while contact plunger 40 rests in the depression 13^a and contact plunger 41 engages the head of screw 23 in the terminal 21. A circuit is therefore completed for the dim head lamp 58 and the tail lamp 49. This circuit may be traced from the grounded source of current 50 through the conductor 48, plug terminal 21, screw 23, contact plunger 41, sleeve or guide 31, plate 33 to the guide or sleeve 32, where the circuit divides, one portion extending through the contact plunger 34, terminal screw 13, conductor 61 and the dim lamp 58 to ground, while the other portion extends through the contact plunger 35, contact screw 22, plug terminal 20, conductor 47 and the tail lamp 49 to ground.

When it is desired to light the bright and tail lamps 57 and 49 the block 30 is rotated to the right as shown in Fig. 2. The plunger 34 is thereby moved into the depression

14* while the plunger 40 is moved into engagement with the head of the terminal screw 14. At the same time plungers 35 and 41 are rotated but still remain in contact with heads of the respective contact screws 22 and 23. The diameter of the heads of these contact screws 22 and 23 is great enough to allow the contact plungers 35 and 41 to engage the respective heads when the rotatable disc is in either of its contact making positions. A circuit is therefore completed through the bright lamp 57 and the tail lamp 49. This circuit may be traced from the grounded source of current 50 through the conductor 48, plug terminal 21, contact screw 23, contact plunger 41, where it divides, one portion extending through the sleeve or guide 31, plunger 40, contact screw 14, conductor 60 and the bright head lamp 57 to ground, and the other portion extending through the sleeve or guide 31, plate 33, sleeve or guide 32, contact plunger 35, contact screw 22, plug terminal 20, conductor 47 and the tail lamp 49 to ground.

When it is desired to extinguish the lamps the actuating lever or rod 43 is moved to the left into its extreme position. The contact plunger 40 then rests in the depression 19 to maintain the rotatable contact carrying disc in this position. The circuits for the lamps are therefore open.

When the herein described switch is mounted directly upon the outer casing of the head light of a motor cycle it is very conveniently located for the operator of the machine. The switch is within reach of the operator who may very easily and quickly manipulate it to control the lamps as desired. All three lamps of a motorcycle—the bright head lamp and the tail lamp or the dim head lamp and the tail lamp—may be controlled from the same switch. This is a decided advantage for the amount of control apparatus requiring attention is thereby reduced.

This switch while particularly useful with motorcycle lighting systems, may of course be employed with the lighting systems of other vehicles or in other fields where electric circuits are to be controlled.

It is obvious that the discs 12 and 16 may be provided with a greater number of contacts whereby the switch may control a greater number of circuits.

What is claimed is:

1. An electric switch comprising a tubular casing, a pair of contact terminals supported in one end of the casing and insulated therefrom, a pair of contact terminals supported in the opposite end of the casing and insulated therefrom, a rotatable block positioned intermediate said pairs of contact terminals, a pair of permanently elec-

trically connected contact members carried by the block each extending through said block longitudinally thereof, and means for rotating the block whereby either of the first mentioned pair of contacts is selectively connected with both contacts of the other pair through one or the other of the electrically connected contact members.

2. An electrical circuit controller comprising a tubular casing, a switching member within said casing and rotatable about the axis thereof, electrical contacts carried by said switching member on both sides thereof, all of said electrical contacts being permanently connected together, a pair of insulated stationary contacts carried at the forward end of said tubular casing and forming parts of separate circuits to be controlled, a pair of insulated stationary contacts carried at the rearward end of said casing, one of which is connected to a source of electrical energy and the other of which is connected to a circuit to be controlled, and means extending through the casing for rotating said switching member to three positions, in one of which the contacts of the switching member are spaced from all stationary contacts and in the others of which the contacts carried by the switching member engage selectively one or the other of the stationary contacts in the forward end of the casing and both contacts in the rear of said casing.

3. An electric circuit controller comprising a rotatable switching member provided on both sides with electrical contacts all of which are electrically connected together, a plurality of insulated stationary contacts at one side of said switch, each of which is connected to a circuit to be controlled, and a plurality of electrical contacts at the other side of said switching member, one of which is connected to a source of electrical energy and another of which is connected to a circuit to be controlled.

4. An electric circuit controller comprising a tubular casing, a pair of electrical contacts at one end of said casing and insulated therefrom, another pair of electrical contacts at the other end of said casing and insulated therefrom, and an insulating switch carrying a pair of electrical conductors extending therethrough and disposed between said pairs of contacts for rotation within the casing, the centers of the contacts at one end of the casing being out of alinement with the centers of the contacts at the other end of the casing but part of each of the contacts at one end being in alinement with part of a contact at the other end.

In witness whereof, I have hereunto subscribed my name.

EUGENE STRAUCH.